

# SEQUENCE LISTING

<110> Blattner, Frederick R.  
Welch, Rodney A.  
Burland, Valerie D.

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<150> 60/242,412

<151> 2000-10-19

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	cagattgtca	gagaatagt	ttgattaggt	aacaatctac	tggaatatt	ggacgtctct	240
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 cgaccggaac tgaatcgcg ggtacaacac cgttggtgaa ccaggacggc gagctggatg 180  
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 gcggtatgac cgtcacsgat gcggattcba ttggyattca gatcgacggc gacaaggcgg 300  
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 ccgtaaacaa taacggcagc accaccgttg acggaaaaga ttccacagcg actgagatta 1020  
 acggtgacaa agccatcgct aacaacgacg gtgacagcac gatccttgat ggcgggcacg 1080  
 gaacccgcat tacgggtgat gatgcgacgg caacaacagc tggcaatacc accgtagacg 1140  
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 ccggggcacca ccggtacact gaacgatcat aacagtacta ctgatattat tgttcctgcc 5100  
 gcaacagagca cacctacgca ggggtcagta ccacagtagc ctgcggactc agtgccacag 5160  
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 gccaa 5225

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<213> Escherichia coli

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[illegible][illegible]

**Figure 6**

caaccgtaac agagccacta atagctccag tacagcaatg agcacgggta acttttgtgt 180  
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at 182

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<212> DNA
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 <213> *Escherichia coli*

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 <222> (118)..(118)  
 <223> Unsure

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gcacagaa 128

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<212> DNA  
<213> Escherichia coli

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<211> 82  
<212> DNA  
<213> Escherichia coli

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gtttgcgcgc atagtgaact ac 82

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<212> DNA  
<213> Escherichia coli

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<210> 129  
<211> 120  
<212> DNA  
<213> Escherichia coli

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gtgctttacg gactaaaaac                                260

<210> 133
<211> 81
<212> DNA
<213> Escherichia coli

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<213> Escherichia coli

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tgcagtgata ccgagagctt cgctcatatg aggttccgca gatgaataac cagttcagat 240
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<223> Unsure

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<223> Unsure

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<223> Unsure

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<220>
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<222> (1902)..(1902)
<223> Unsure

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<223> Unsure

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<220>
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<223> Unsure

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2147

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137  
727  
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 <213> Escherichia coli

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gcagaataaa gcac	74

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 <213> Escherichia coli

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 <213> Escherichia coli

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<210> 158  
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 <212> DNA  
 <213> Escherichia coli

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46

<210> 159

<211> 61

<212> DNA

<213> Escherichia coli

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61

<210> 160

<211> 2326

<212> DNA

<213> Escherichia coli

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840

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900



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 <213> Escherichia coli

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<210> 163  
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 <212> DNA  
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gaaatgtcaa tctcgaacaa ttaaagcaaa aagctgaaa tgagagaagct aaagcacagt	240
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tggactgggt tcgccgtgco gcagagcagg gatacacccc ggcagaatat gtaactgggt	360
tacgctatat gaacggtgaa ggtgtgccgc aagattatgc tcaggcagtt atctggtaca	420

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 <212> DNA  
 <213> Escherichia coli

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tcattgccgc	aactaacgca	atcagcacga	acaagatggt	ataagcgggtg	ggaaatttga	1980
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 <211> 1144  
 <212> DNA  
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gaccatgttg ggtgggtctg atgctggcag tgagtttcta ttacaatatt acccgcgagt	1080
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<210> 219  
 <211> 102  
 <212> DNA  
 <213> Escherichia coli

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<210> 220  
 <211> 14518  
 <212> DNA  
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 <223> Unsure

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ttacttcacc acttccatca gcttactgaa gctatccact acgtcatact tcacgttttc	180
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tttatgagaa acttaatatg aaaagctctt ttgatttaac aaaagatgtt tgtaattctt	7680
cagaatgggg attggctgaa ctgaaaaatga gacatgaaaa aatgaaaacg caattgaaga	7740
agctttggtt ggtctgacat atctaaagag ttccactcgt aataatgttg cggtggaact	7800
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<210> 226  
 <211> 114  
 <212> DNA  
 <213> Escherichia coli

<400> 226	
tttgcttcc agatatgcgt aaagcccgga aggtccgggc tggggatttg ccggatgcgg	60
cgtaaacgcc ttatccggcc tacgatagac attttgtaag ccgataaag caac	114

<210> 227  
 <211> 5353  
 <212> DNA  
 <213> Escherichia coli

<400> 227	
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<212> DNA  
 <213> Escherichia coli

<400> 228  
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 aagtcataa 69

<210> 229  
 <211> 54  
 <212> DNA  
 <213> Escherichia coli

<400> 229  
 gcttgatttg ccggatgatg cagcgatgct catccggctc ccgattacc tegt 54

<210> 230  
 <211> 710  
 <212> DNA  
 <213> Escherichia coli

<400> 230  
 ttattgtgca cagaaaaccc ccagctaggc tgggggttcc ggaaagcttt cagctttgag 60  
 ccagttatta aaaccccttt tgatttgta aaacaccttg cggtctggca actgcaagtg 120  
 tcaaaacaaga aatcaaaaagg gggccccaat ggggaacgaa aagagcttag cgacaccccg 180  
 atgggaactgt aaatatcaca tagtatttgc gccaaaatac cgaagacagg tgttctacag 240  
 agagaagcgt agagcaaatg gctgtatttt gagaagctg tgtgagtga aaagtgtacg 300  
 gattctggaa gctgaatgct gtgcagatca tatccatag cttgtggaga tcccgcccaa 360  
 aatgagcgta tcaggcttta tgggatatct gaaagggaaa agcagctgta tgccttacga 420  
 gcagtttgtt gatttgaaat tcaaatacag gaacaggagg ttctgggtga gagggattta 480  
 cgctcgatacg gtgggtaaga acacggcgaa gatacaggat tacataaagc accagcttga 540  
 agaggataaa atgggagagc agttatcgat tccctatccg ggcagcccggt ttacggggcg 600  
 taagtaacga agttggatgc aaatgtcaga tcgtgtgcgc ctgttagggc gcggctggta 660  
 agagagcctt ataggcgcat ttgaaaaacc tccggctatg ccggaggata 710

<210> 231  
 <211> 713  
 <212> DNA  
 <213> Escherichia coli

<400> 231  
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 gttattaaaa ccccttttga ttgttaaaa caccttgcgg tctggcaact gcaagtgtca 120  
 aacaagaaat caaaaggggg tcccaatggg gaacgaaaaa agcttagcgc acacccgatg 180





caagaaatca aaagggggtc ccaatgggga acgaaaagag cttagcgcac acccgatgga	180
actgtaaata tcacatagta ttgcgccaa aataccgaag acaggtgttc tacagagaga	240
agcgtagagc aataggctgt attttgagaa agctgtgtga gtggaaaagt gtacggattc	300
tggaaagtga atgctgtgca gatcatatcc atatgcttgt ggagatcccg cccaaaatga	360
gcgtatcagg ctttatggga tatctgaaag ggaaaagcag tctgatgcct tacgagcagt	420
ttggtgattt gaaattcaaa tacaggaaca gggagtctgt gtgcagaggg tattacgtcg	480
atacgggtgg taagaacacg gcgaagatac aggattacat aaagcaccag cttgaagagg	540
ataaaatggg agagcagtta tcgattccct atccgggcag cccgtttacg gccgtaagt	600
aacgaagttg gatgcaaatg tcagatcgtg tgcgcctgtt agggcgcggc tggtaagaga	660
gccttatagg cgcatttgaa aaacctccg ctatgccgga ggatatatat t	711

<210> 234  
 <211> 395  
 <212> DNA  
 <213> Escherichia coli

<400> 234	
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agggtgtacaa tgtacctgcc agggaggggg aatgggtaag gcgataatat ttatagagac	120
gccaatgttt acgcgtcaga tcaagcagat tgcaaccgat gatgaattaa aggaattaca	180
aaaagaactc atcggaactc ccgataaagg tgatctcatt cagcagactg gtggattgag	240
taaagtccga atggctgcgg gtccacaggg aaaaagtggc agtgctcagaa taatttactt	300
tctggcgacg gaagagatta tttatttgat tatggcctat ccgataaatg ccaagatag	360
tctgacagat acggaaaaag ctcaactaaa gaagt	395

<210> 235  
 <211> 202  
 <212> DNA  
 <213> Escherichia coli

<400> 235	
cgtagcaac tcaacgtttc tcaaatgtgag atggcaaaag ctctgggaac cagtggtgat	60
accattaaaa gctgggaatc gaagcgaaga aatcctacgg gattggctgc aaaaagtactt	120
gccacaatta aagaaaatcc tgcctttttc cgggaacttg cttccatta atcatttaac	180
taataccgga tgcgatgctg gt	202

<210> 236  
 <211> 711

<212> DNA  
<213> Escherichia coli

<400> 236  
gtgcacagaa aacccccagc taggctgggg gttccggaaa gctttcagct ttgagccagt 60  
tattaaaacc ccttttgatt tgttaaaaca ccttgccggtc tggcaactgc aagtgtcaaa 120  
caagaaatca aaaggggggtc ccaatgggga acgaaaagag cttagcgcac acccgatgga 180  
actgtaaata tcacatagta tttgcgccaa aataccgaag acaggtgttc tacagagaga 240  
agcgtasagc aataggctgt attttgagaa agctgtgtga gtggaaaagt gtacggattc 300  
tggaagctga atgctgtgca gatcatatcc atatgcttgt ggagatcccg cccaaaatga 360  
gcgtatcagg ctttatggga tatctgaaag ggaaaagcag totgatgcct tacgagcagt 420  
ttggtgattt gaaattcaaa tacaggaaca gggagtctct gtgcagaggg tattactgtc 480  
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ataaaatggg agagcagtta tcgattccct atccgggcag cccgtttacg ggcgtaagt 600  
aacgaagtgt gatgcaaatg tcagatcgtg tgcgcctgtt agggcgccggc tggtaagaga 660  
gccttatagg cgcatttgaa aaacctccgg ctatgccgga ggatatttat t 711

<210> 237  
<211> 174  
<212> DNA  
<213> Escherichia coli

<400> 237  
agactgatga caaacgcaaa actgcctgat gcgtacgct tatcaggcct acgatcttct 60  
tgcaatatat tgaatttgca cgattttgta ggccggataa ggcgttcacg ccgcatccgg 120  
cataaacaac gcgcacgttg ttaacaatct tatcccttcg agcgggggga gctt 174

<210> 238  
<211> 3999  
<212> DNA  
<213> Escherichia coli

<400> 238  
cagggtatca caaaaaaagg tgttttctc tatcaaaagt gaatggctaa aggaaattaa 60  
ttattaaagg ttactgtaat actatagaga gacaaagaaa tacgttcagc agctaagtct 120  
aagttcatca tgaataatgc ctataaatca aagggtgatg tttaaaacag acacattttc 180  
tgaaacacga taccctccg cccgttcgca aaagtaatct gcgatcttca tcacgcttcg 240  
atagtcatct ttaatatata tggcctggtc attcttaata aaaatgaatt gtctggtgta 300  
ttaattccta tggaatcata aaaacaatga atggagaaca tattatatgt ctgccaaaag 360



cagccattat	taaatatggt	aaacatctac	cacaggaat	ggtttcagat	acaccggtt	2220
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gtacttttca	tggtaatcg	ctggttctcg	ttcttgagca	aaaagcattg	aaacgcgaaa	2340
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ccgcgagatg	cggcgatgca	cattgaacag	tcgcacgcgt	tttatccact	ttgtggagaa	3900
ccatcctcttc	cttatatcat	tgaaccgaat	gtctcctcgc	aatgtcgttt	ctacattaga	3960

tatcctcaaa catctgtgga ataaaaaact agagcatgg

3999

<210> 239

<211> 52

<212> DNA

<213> Escherichia coli

<400> 239

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52

<210> 240

<211> 425

<212> DNA

<213> Escherichia coli

<400> 240

ctctaataat aaaacaagga agtgttctat gacgtatgga gaagcgtatc tggaaggggtg

60

gaaaaacatc ttaataatg aagggtgttc caatcgcttc gagttctggt cgtttatgat

120

tggtagtggc gttatctgtc tgcttccgct tttatgttgg tggtagcgg taacaattaa

180

caatgactat ggtgttttca ttttttttgc gctgcccggt tcattttatt taacgttgat

240

ttttgcgta ccggcgatag cgttagccgt cagaaggatg cacgatatcg gatattcagg

300

gtggtgggtt accattgccc tgttgatccc tgttacgggc gtaattctcg ttatactgtg

360

ctgcctgcgg tcaaaagtcac aagaccaggc ataatgccag agggatgatc gcatcacttt

420

ctgcg

425

<210> 241

<211> 635

<212> DNA

<213> Escherichia coli

<400> 241

ttagaattcc ggcatactg atacgtgcag atatacgtgt atactagacg tataaaattgt

60

acaggagcac gagatcatga ctgcaaaacg taccacacaa agtgtgaccg tcaccgtcga

120

ccgtgagtta gtcaatcggc ctcgatgatg aggccttaaat atgagcga cccttacggg

180

tgcgctcaat gctgaactta aaaaacatgc agcaaacacgt tggcgtgaag agaacgcaga

240

agctatcgct gcgtaaatc aattggctga tgaaacggga tgtttctctg atgagtaccg

300

gagctcttag cgatgcaatt tacggtatgc cgcagtcggc gcaggaaacg cgcggttccc

360

tttgttattg atgttaccag cgacattatt ggtgagatta atcgccggtat cgttattcca

420

ttaacaccta ttgaacgatt tagccgtatt cgcccaccag aacggcctaa cccaatcctt

480

ttactggtag acggcaaaa atattgtctc atgacgcatg agactgcaac tgttccagtt

540

aacgcgctgg gaacgaaatt ttgcgatgcc agcgcgcacc gaacgttgat taaaggagca

600

ttagatttta tgctcgacgg gatttaagac gctac

635

<210> 242  
<211> 119  
<212> DNA  
<213> Escherichia coli

<400> 242  
aagtttcaac gtgtaggcct gataagacgc ggcccgcgtc gcatcaggca atcggcgcaa 60  
aattgcgga tgcggcgta acgccttctc cgccctaccg aacttcgcca gcgtgacta 119

<210> 243  
<211> 1827  
<212> DNA  
<213> Escherichia coli

<400> 243  
agggcagggt gtgaataata agaaagaagg gggggaaccc ccttgctttc ttcactctgac 60  
gttatttata tatttcacgg gggattaatt ttagttattt ttagttgaat cgttttacct 120  
gaattathtt ttttcttgat aaaatatcga caacgatttc tttttgtaaa aataaaacga 180  
aggcttatgt atcgggatac ccatcatgaa catattgtcc ggttgcacga ggagaatata 240  
tcaagcggtt tgttcactgt aggaacacca cattgagcgg ttatggcagg cacttcacgc 300  
caccataaat gccgttcgat gtggcagttg ttgaaaaaag tacggcattc tatgaaaaac 360  
gccagtact cctcagagg agaacatggt ctggcaaaaag ttagcgggca tcaggcgag 420  
ctatctttgt aaattcattc ataaaatgaa ttgtatacaa aaaaatattg aaaaataata 480  
tttttcttta ttgatattat ttgctatacg ttttttttga ggggagattg tgatgagcaa 540  
acgtaacgat attactgatg gaatatattgc aacaacgaaa aagtatggat tagtttatac 600  
cgaagagtta ggttgatcgt atttggggca tgctcagggg caagatgccg gaattattaaa 660  
aagaaaattg gagcaagaac atttttcaac atattacgat gaatttcatt attggtattt 720  
tcctggtgat tatcatcagg aaatgggaat tcggaaaaaa tattaggagt agatcttaca 780  
tttcataccg gtgtttatag gaagggttatg gttcgttcat gtctttcacc cactctttaa 840  
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aatactgagt ttaacgccat cttatttaca accatctctc cttttaaaaa aaatcaacta 1140  
ataaaaaaga agcttccaga atggttaaat tatataaagc cattagatga gtctttttca 1200

acattgttat ataatacaata taataataga cctgttacta attattataa agataaaaaac	1260
agaataaaac atgagtttgta tagttcatta tcaagttcgg gagctataaa gttttcagaa	1320
tctccctttg aaagaccgct ttttcttttc ttaaacccctc attatccgca caggctcgta	1380
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gagtagatct attactataa tgttgatgat atgcaaacaa gagtgattgt tacatggcga	1620
aatatagata acatttttct tcagaaagca aagctaatag attttttgaa aagaatggga	1680
ccgagctac aaacgattg tatatggttt ttctcatgata aaagtgatta tgcaataaat	1740
ttccagcgtt attgcgtcat tgagcacgct gattctctgc aggtggaata ttttgagact	1800
atcgatgat aggcagaggg tgtctttt	1827

<210> 244  
 <211> 712  
 <212> DNA  
 <213> Escherichia coli

<400> 244	
tttgtgcaca gaaaaccccc agctaggctg ggggttcogg aaagctttca gctttgagcc	60
agttattaaa accccttttg atttgttaaa acactttgcg gctcggcaac tgcaagtgtc	120
aaacaagaaa tcaaaagggg gtcccaatgg ggaacgaaaa gagcttagcg cacaccgat	180
ggaactgtaa atatcacata gttttttgocg caaaataccg aagacagggt ttctacagag	240
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ttctggaagc tgaatgctgt gcagatcata tccatatgct tgtggagatc ccgccccaaa	360
tgagcgtatc cgggttttatg ggatatctga aagggaanaag cagtctgatg ctttacgagc	420
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tcgatacagt gggtaagaac acggcggaaga tacaggatta cataaagcac cagcttgaag	540
aggataaaat gggagagcag ttatcgattc cctatccggg cagcccgttt acgggcccgt	600
agtaacgaag ttggatgcaa atgtcagatc gtgtgcgcct gttaggcgcc ggctggtgaag	660
agagccttat aggcgcattt gaaaaacctc cggctatgcc ggaggatatt ta	712

<210> 245  
 <211> 711  
 <212> DNA  
 <213> Escherichia coli





<213> Escherichia coli

<400> 247

gtgcacagaa aacccccagc taggctgggg gttccggaaa gctttcagct ttgagccagt	60
tattaaaacc ctttttgatt tgtaaaaca ctttgcggtc tggcaactgc aagtgtcaaa	120
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Val Ala Gly Lys Ala Ala Asn Val Met Val Ala Asn Pro Tyr Gly Ile	
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Thr Gly Lys Pro Val Met Asn Ala Asp Gly Ser Leu Gln Ala Leu Glu	
160 165 170 175	
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Val Thr Glu Gly Ser Ile Thr Ile Asn Gly Ala Gly Leu Asp Gly Thr	
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cgg agc gat gcc gta tcc att att gcc cgt gca acg gaa gtg aat gcc	12624
Arg Ser Asp Ala Val Ser Ile Ile Ala Arg Ala Thr Glu Val Asn Ala	
195 200 205	
gcg ctt cat gcg aag gat tta act gtc act gca ggc gct aac cgt gta	12672
Ala Leu His Ala Lys Asp Leu Thr Val Thr Ala Gly Ala Asn Arg Val	
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act gca gat ggt cgt gtc aga gcc ctg aag ggc gaa ggt gat gtg ccg	12720
Thr Ala Asp Gly Arg Val Arg Ala Leu Lys Gly Glu Gly Asp Val Pro	
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Lys Val Ala Val Asp Thr Gly Ala Leu Gly Gly Met Tyr Ala Arg Asn	
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Ile His Leu Thr Ser Thr Glu Ser Gly Val Gly Val Asn Leu Gly Asn	
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Leu Tyr Ala Arg Asp Gly Asp Ile Thr Leu Asp Ala Ser Gly Arg Leu	
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Thr Val Asn Asn Ser Leu Ala Thr Gly Ala Val Thr Ala Lys Gly Gln	
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Gly Val Thr Leu Thr Gly Asp His Lys Ala Gly Gly Asn Leu Ser Val	
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Ser Ser Arg Arg Asp Ile Val Leu Ser Asn Gly Thr Leu Asn Ser Asp	
320 325 330 335	
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Lys Asp Leu Ser Leu Thr Ala Gly Gly Arg Ile Thr Gln Gln Asn Glu	
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Lys Leu Thr Ala Gly Arg Asp Val Thr Leu Ala Ala Lys Asn Ile Thr	
355 360 365	
cag gat acc gcc agc cag att aac gcg gcc cgc gat atc gtg act gtc	13152

Gln Asp Thr Ala Ser Gln Ile Asn Ala Ala Arg Asp Ile Val Thr Val	
370 375 380	
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Ala Ser Asp Thr Leu Thr Gln Gly Gln Ile Thr Ala Gly Gln Asn	
385 390 395	
ctc acg gcc agc gcc acc acg ctg acg cag gac gga ata ttg ctg gcg	13248
Leu Thr Ala Ser Ala Thr Thr Leu Thr Gln Asp Gly Ile Leu Leu Ala	
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Lys Ser His Ala Gly Leu Asn Ala Gly Thr Leu Asn Asn Ser Gly Ala	
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Val Gln Gly Ala Thr Leu Thr Leu Gly Ser Thr Thr Leu Ser Asn Ser	
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Gly Ser Leu Leu Ser Gly Gly Pro Leu Thr Met Asn Thr Arg Asp Phe	
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Thr Gln Ser Ser Gly Arg Thr Gly Ala Lys Gly Lys Val Asp Ile Met Ala	
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Ser Gly Lys Leu Thr Ser Thr Gly Leu Leu Val Ser Asp Xaa Ala Leu	
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Val Leu Lys Ala Gln Asp Val Thr Gln Asn Gly Val Leu Ser Gly Gly	
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Lys Gly Leu Thr Val Ser Ala Gln Thr Leu Ser Ser Gly Lys Lys Ser	
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Val Thr His Ser Asp Ala Ala Met Thr Leu Asn Val Thr Thr Val Ala	
530 535 540	
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Leu Asp Gly Glu Thr Ser Ala Gly Asp Thr Leu Arg Val Gln Ala Asp	
545 550 555	
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Lys Leu Ser Thr Thr Ala Ala Gly Ala Gln Leu Gln Ser Gly Lys Asn Leu	
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Ser Ile Asn Ala Arg Asp Ala Arg Leu Ala Gly Thr Gln Ala Ala Gln	
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Gln Thr Met Val Val Asn Ala Ser Glu Lys Leu Thr His Ser Gly Lys	
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Ser	Ser	Ala	Pro	Ser	Leu	Ser	Leu	Ser	Ala	Pro	Glu	Leu	Thr	Ser	Ser		
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Asn	Ser	Gly	Leu	Leu	Gln	Gly	Glu	Ala	Ser	Leu	Thr	Val	Asn	Thr	Gln		
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Ile	Ala	Asp	Thr	Leu	Ser	Val	Arg	Ala	Thr	Thr	Thr	Asp	Gly	Asp	Gly		
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Leu	Leu	Gln	Gly	Ala	Gly	Ala	Leu	Ala	Leu	Ala	Gly	Asp	Thr	Leu	Ser		
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Gln	Gly	Ser	His	Gly	Arg	Trp	Leu	Thr	Ala	Asp	Asp	Leu	Ser	Leu	Arg		
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Asp	Asn	Arg	Gly	Thr	Val	Gln	Gly	Asn	His	Val	Thr	Ile	Arg	Gln	Asn		
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Ser Leu Asn	Ala Thr Asp Arg Leu	Gln Asn Asp Gly Lys	Ile Leu	
1085		1090	1095	
tcc ggc agt	aac ctc acg ctg acg	gcg cag gtg ctg gcg	aac acc	15339
Ser Gly Ser	Asn Leu Thr Leu Thr	Ala Gln Val Leu Ala	Asn Thr	
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Gly Ser Gly	Leu Val Gln Ala Ala	Thr Leu Leu Leu Asp	Val Val	
1115		1120	1125	
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Asn Thr Val	Asn Gly Gly Arg Val	Leu Ala Thr Gly Ser	Ala Asp	
1130		1135	1140	
gtt aaa gga	acc acg ctg aat aat	acc ggt acg ctt cag	ggg gcg	15474
Val Lys Gly	Thr Thr Leu Asn Asn	Thr Gly Thr Leu Gln	Gly Ala	
1145		1150	1155	
kac ytg ctg	gtg aat tac cac aca	ttc agc arc agc ggt	acc ctg	15519
Xaa Xaa Leu	Val Asn Tyr His Thr	Phe Ser Xaa Ser Gly	Thr Leu	
1160		1165	1170	
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Leu Gly Thr	Ser Gly Leu Gly Val	Lys Gly Ser Ser Leu	Leu Gln	
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Asn Gly Thr	Gly Arg Leu Tyr Ser	Ala Gly Asn Leu Leu	Leu Asp	
1190		1195	1200	
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Ala Gln Asp	Phe Ser Gly Gln Gly	Gln Val Val Ala Thr	Gly Asp	
1205		1210	1215	
gtc aca ctg	aaa ctg att gct gcc	ctc acg aat cat ggt	acc ctg	15699
Val Thr Leu	Lys Leu Ile Ala Ala	Leu Thr Asn His Gly	Thr Leu	
1220		1225	1230	
gcc gca ggg	aaa acc ctt tcc gtc	acg tcg caa aat gcc	atc acc	15744
Ala Ala Gly	Lys Thr Leu Ser Val	Thr Ser Gln Asn Ala	Ile Thr	
1235		1240	1245	
aac ggc ggt	gtc atg cag ggt gat	gcc atg gtg ctc ggt	gcc gga	15789
Asn Gly Gly	Val Met Gln Gly Asp	Ala Met Val Leu Gly	Ala Gly	
1250		1255	1260	
gag gca ttc	acc aac aat gga mcg	ctg act gcc ggt aaa	ggc aac	15834
Glu Ala Phe	Thr Asn Asn Gly Xaa	Leu Thr Ala Gly Lys	Gly Asn	
1265		1270	1275	
agt gtt ttc	agc gca cag cgt ctt	ttc ctt aac gca ccg	ggg tca	15879
Ser Val Phe	Ser Ala Gln Arg Leu	Phe Leu Asn Ala Pro	Gly Ser	
1280		1285	1290	
ctt cag ggc	ggg ggc gat gtg agt	ctg aac agc cgg agt	gat atc	15924
Leu Gln Gly	Gly Gly Asp Val Ser	Leu Asn Ser Arg Ser	Asp Ile	
1295		1300	1305	
acc atc agt	ggg ttt acc ggc acg	gca ggc agt ctg aca	atg aat	15969



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	1330	1335		
	ctg ttt aca gac cgt	ctg cat aac cag cat	ggt gat	16059
0	Leu Phe Thr Asp Arg	Leu His Asn Gln His	Gly Asp	
	1345	1350		
	ggc aac agt ctg tgg	gta cag aag gat gct	tcc ggc	16104
5	Gly Asn Ser Leu Trp	Val Gln Lys Asp Ala	Ser Gly	
	1360	1365		
	aca gag att atc aat	aat tcc ggg aat att	gag acg	16149
0	Thr Glu Ile Ile Asn	Asn Ser Gly Asn Ile	Glu Thr	
	1375	1380		
	gat att gtt gta aga	acc ggg cat ctt ctg	aac cag	16194
5	Asp Ile Val Val Arg	Thr Gly His Leu Leu	Asn Gln	
	1390	1395		
	ttt tct gcc aca aca	aca acc cgg act aac	ccc tca	16239
0	Phe Ser Ala Thr Thr	Thr Thr Arg Thr Asn	Pro Ser	
	1405	1410		
	gga atg gga aat gct	ctg gtt gat att ccc	ctt tcc	16284
5	Gly Met Gly Asn Ala	Leu Val Asp Ile Pro	Leu Ser	
	1420	1425		
	gac ggc agc tat ggc	tat ttc acc cgt gaa	gtt gaa	16329
0	Asp Gly Ser Tyr Gly	Tyr Phe Thr Arg Glu	Val Glu	
	1435	1440		
	ggt acg ccc tgc aac	ggg cac ggg gca tgc	aat atc	16374
5	Gly Thr Pro Cys Asn	Gly His Gly Ala Cys	Asn Ile	
	1450	1455		
	acg ctt tat tat tac	gcg ccg ttt gct gac	agt gcc	16419
0	Thr Leu Tyr Tyr Tyr	Ala Pro Phe Ala Asp	Ser Ala	
	1465	1470		
	ttt ctc agc agc cag	aac atc aca aca gta	acc ggt	16464
5	Phe Leu Ser Ser Gln	Asn Ile Thr Thr Val	Thr Gly	
	1480	1485		
	ccg gca ggc cgc att	gcg tca ggg cgt aat	ctt tct	16509
0	Pro Ala Gly Arg Ile	Ala Ser Gly Arg Asn	Leu Ser	
	1495	1500		
	gaa cga ctg gaa aac	cgg gcg tca ttt atc	ctg gcg	16554
5	Glu Arg Leu Glu Asn	Arg Ala Ser Phe Ile	Leu Ala	
	1510	1515		
	atc gca ctc tcg ggc	aga gag tta agc aat	cag agc	16599
0	Ile Ala Leu Ser Gly	Arg Glu Leu Ser Asn	Gln Ser	
	1525	1530		
	ggg aca gag aat gaa	tat ctg gta tac cgc	tac gac	16644

Ser Ser Tyr	Phe Leu Asp Arg Leu Gly Leu Lys Pro Glu Lys Asp	
1760	1765 1770	
tat cgt ttc	ctg ggg gat gcg gtc	ttt gat acc cgg tat gtc agt
Tyr Arg Phe	Leu Gly Asp Ala Val Phe Asp Thr Arg Tyr	Val Ser
1775	1780 1785	17364
aac cgc gtg	ctg agc cgg acg ggt	tca cgt tat ctc aac gga ctg
Asn Ala Val	Leu Ser Arg Thr Gly Ser Arg Tyr Leu Asn	Gly Leu
1790	1795 1800	17409
ggt tca gac	acg gaa cag atg cgg	tat ctg atg gat aac gcg gcc
Gly Ser Asp	Thr Glu Gln Met Arg Tyr Leu Met Asp Asn	Ala Ala
1805	1810 1815	17454
aga caa cag	aaa gga ctg gga tta	gag ttt ggt gtg cgc ctg aca
Arg Gln	Lys Gly Leu Gly Leu	Glu Phe Gly Val Ala Leu Thr
1820	1825 1830	17499
gct gaa cag	att gct cag ctt gac	ggc agc ata ctg tgg tgg gag
Ala Glu Gln	Ile Ala Gln Leu Asn	Gly Ser Ile Leu Trp Trp Glu
1835	1840 1845	17544
tca gtc acc	atc aac gga caa aca	gtc atg gtc cgc aaa ctg tat
Ser Val Thr	Ile Asn Gly Gln Thr Val Met Val Pro Lys	Leu Tyr
1850	1855 1860	17589
ctg tcg cgc	gaa gat atc acc ctg	cat aac ggc agc gtt atc agc
Leu Ser Pro	Glu Asp Ile Thr Leu His Asn Gly Ser Val	Ile Ser
1865	1870 1875	17634
ggg aac aac	gtg caa ctt gcg ggc	ggc aat atc acc aac agc ggc
Gly Asn Asn	Val Gln Leu Ala Gly Gly Asn Ile Thr Asn	Ser Gly
1880	1885 1890	17679
ggc agc atc	aac gca cag aac gac	ctc tcg ctc gac agt tcc ggc
Gly Ser Ile	Asn Ala Gln Asn Asp Leu Ser Leu Asp Ser	Ser Gly
1895	1900 1905	17724
tat atc gac	aac ctg aat gcg ggg	ctg ata agc gcg ggc ggt agc
Tyr Ile Asp	Asn Leu Asn Ala Gly Leu Ile Ser Ala Gly	Gly Ser
1910	1915 1920	17769
ctg gac ctg	agc gcc atc ggg gat	atc agc aat atc agc tca gtc
Leu Asp Leu	Ser Ala Ile Gly Asp Ile Ser Asn Ile Ser	Ser Val
1925	1930 1935	17814
atc agc ggt	aaa acc gta caa ctg	gaa agc gtg agt ggc aac atc
Ile Ser Gly	Lys Thr Val Gln Leu Glu Ser Val Ser Gly	Asn Ile
1940	1945 1950	17859
agc aat atc	acc cgg cgt cag caa	tgg aat cgc ggc agt gac agc
Ser Asn Ile	Thr Arg Arg Gln Gln Trp Asn Ala Gly Ser	Asp Ser
1955	1960 1965	17904
caa tat ggt	ggt gtg cat ctc agc	ggt acg gac acc ggt ccg gtt
Gln Tyr Gly	Gly Val His Leu Ser Gly Thr Asp Thr Gly	Pro Val
1970	1975 1980	17949
gcg acc att	aaa ggc act gat tca	ctt tcg ctg gat gca ggg aaa

Ala Thr Ile 1985	Lys Gly Thr Asp Ser 1990	Leu Ser Leu Asp Ala 1995	Gly Lys	
aac att gat Asn Ile Asp 2000	att acc ggg gca acg Ile Thr Gly Ala Thr 2005	gtc tcg tcc ggt gga Val Ser Ser Gly Asp 2010	gac ctt Leu	18039
gga atg tct Gly Met Ser 2015	gcg ggt aat gat atc Ala Gly Asn Asp Ile 2020	aac att gcc gca aac Asn Ile Ala Ala Asn 2025	ctg ata Leu Ile	18084
agt ggg agc Ser Gly Ser 2030	aaa agt cag tcc ggt Lys Ser Gln Ser Gly 2035	ttc tgg cac act gat Phe Trp His Thr Asp 2040	gac aac Asp Asn	18129
agt tca tca Ser Ser Ser 2045	tcc acc acc tca cag Ser Thr Thr Ser Gln 2050	ggc agc agc atc agc Gly Ser Ser Ile Ser 2055	gcc ggc Ala Gly	18174
ggt aac ctg Gly Asn Leu 2060	gcg atg gct gca ggc Ala Met Ala Ala Gly 2065	cat aat ctg gat gtc His Asn Leu Asp Val 2070	acg gca Thr Ala	18219
tcc tct gtt Ser Ser Val 2075	tct gcc ggg cac agc Ser Ala Gly His Ser 2080	gcc ctg ctt tct gca Ala Leu Leu Ser Ala 2085	ggt aac Gly Asn	18264
gac ctg agt Asp Leu Ser 2090	ctg aat gca gtc agg Leu Asn Ala Val Arg 2095	gaa agc aaa aac agt Glu Ser Lys Asn Ser 2100	cgc aac Arg Asn	18309
ggc agg tca Gly Arg Ser 2105	gaa agt cat gaa agc Glu Ser His Glu Ser 2110	cac gca gct gtg tcc His Ala Ala Val Ser 2115	acg gtg Thr Val	18354
aca gcg ggc Thr Ala Gly 2120	gat aac ttc ctc ctt Asp Asn Phe Leu Leu 2125	gtt gcc ggt cgt gat Val Ala Gly Arg Asp 2130	att gcc Ile Ala	18399
agt cag gct Ser Gln Ala 2135	gcc ggt atg gct gcg Ala Gly Met Ala Ala 2140	gaa aat aac gtg gtc Glu Asn Asn Val Val 2145	atc cgg Ile Arg	18444
ggc gga cgt Gly Gly Arg 2150	gat gtg aac ctg gtg Asp Val Asn Leu Val 2155	gca gag tct gcc ggc Ala Glu Ser Ala Gly 2160	gca ggc Ala Gly	18489
gac agc tat Asp Ser Tyr 2165	acg tcg aag aaa aag Thr Ser Lys Lys Lys 2170	aaa gag att aac gag Lys Glu Ile Asn Asn 2175	aca gtc Thr Val	18534
cgt cag cag Arg Gln Gln 2180	gga acg gaa atc gcc Gly Thr Glu Ile Ala 2185	agc ggt ggt gac acc Ser Gly Gly Asp Thr 2190	acc gtc Thr Val	18579
aac gca gga Asn Ala Gly 2195	cgg gat atc acc gct Arg Asp Ile Thr Ala 2200	gtt gcg tca tcc gtt Val Ala Ser Ser Val 2205	acc gca Thr Ala	18624
acc ggc aat 2210	atc agc gtg aat gcc 2215	ggt cgt gat gtt gcc 2220	ctg acc	18669

Thr Gly Asn 2210	Ile Ser Val Asn 2215	Ala Gly Arg Asp Val Ala 2220	Leu Thr	
acg gcg aca 2225	gaa agt gac tat 2230	cac His Tyr Leu Glu Thr 2235	aaa aaa Lys Lys	18714
agc gga ggt 2240	ttt ctc agt aag 2245	aaa acc acc cgc acc 2250	atc agt gag Ser Glu	18759
gac agt gcc 2255	acc cgt gaa gca 2260	ggc Gly Ser Leu Leu Ser 2265	aac cgc Asn Arg	18804
gtg acc gtt 2270	aac gcc ggt gat 2275	aac cgc gta gag ggt 2280	tcg gat Ser Asp	18849
gtg gtg gct 2285	gac cgg gat gtg 2290	tca Ser Leu Ala Ala Gly 2295	cat gtt His Val	18894
gat gtt ctt 2300	gct gcc acc agt 2305	aca gat acg tcc tgg cgc 2310	ttt aag Phe Lys	18939
gaa acg aag 2315	aaa tcc ggt ctg atg 2320	ggc acc ggc ggt att 2325	ggc ttc Gly Phe	18984
acc att ggc 2330	agc agt aag aca acg 2335	cac gac cgg cgc gag 2340	gcc ggg Ala Gly	19029
aca acg cag 2345	agt cag agt gcc agc 2350	acc atc ggc tcc act 2355	gcc ggt Ala Gly	19074
aat gtc agt 2360	att acc gcg ggc aaa 2365	cag gct cat atc agc 2370	ggc tgc Gly Ser	19119
gat gtg att 2375	gcg aac cgg gat atc 2380	agc att acc ggt gac 2385	agt gtg Ser Val	19164
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gag cag aag 2405	aaa agc ggg ctg acg 2410	ggt gcc ctt tcc ggc 2415	acg gtg Thr Val	19254
ggc agt gcc 2420	atc aat aat gcg gtt 2425	acc agt gca cag gag 2430	acg aag Thr Lys	19299
gag agc agt	gac agc cgt ctg aaa	gcc ctg cag gcc aca	aag aca	19344

Glu Ser Ser	Asp Ser Arg Leu Lys	Ala Leu Gln Ala Thr	Lys Thr	
2435		2440	2445	
gcg ctg tct	ggt gtg cag gcc gga	cag gct gcg aca atg	gcc tcc	19389
Ala Leu Ser	Gly Val Gln Ala Gly	Gln Ala Ala Thr Met	Ala Ser	
2450	2455	2460		
gca acc ggt	gac ccg aat gcg atg	gga gtc agc ctg tgc	ctc acc	19434
Ala Thr	Asp Pro Asn Ala Met	Gly Val Ser Leu Ser	Leu Thr	
2465	2470	2475		
acc cag aaa	tcg aaa tca caa caa	cat tct gaa agt gac	aca gta	19479
Thr Gln Lys	Ser Lys Ser Gln Gln	His Ser Glu Ser Asp	Thr Val	
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tcc gcc agt	acg ctg aat gcc ggg	aat aat ctg tct gtt	gtc gca	19524
Ser Gly Ser	Thr Leu Asn Ala Gly	Asn Asn Leu Ser Val	Val Ala	
2495	2500	2505		
acc ggt aaa	aac agg gcc gat aac	cgc gga gat att gtg	att gcc	19569
Thr Gly Lys	Asn Arg Gly Asp Asn	Arg Gly Asp Ile Val	Ile Ala	
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gga agc cag	ctt aag gcc ggt ggt	aac aca agc ctg gat	gcc gcg	19614
Gly Ser Gln	Leu Lys Ala Gly Gly	Asn Thr Ser Leu Asp	Ala Ala	
2525	2530	2535		
aat gat att	ctg ttg agt gcc gcc	gca aac aca caa aaa	aca acg	19659
Asn Asp Ile	Leu Leu Ser Gly Ala	Ala Asn Thr Gln Lys	Thr Thr	
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Gly Arg Asn	Ser Ser Ser Gly Gly	Gly Val Gly Val Ser	Ile Gly	
2555	2560	2565		
gcc ggt ggt	aac ggt gcc ggt atc	agc gtc ttt gcc gcc	gtt aat	19749
Ala Gly Gly	Asn Gly Ala Gly Ile	Ser Val Phe Ala Gly	Val Asn	
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gcg gca aaa	ggc agc gag aaa ggt	aac ggt act gag tgg	act gaa	19794
Ala Ala Lys	Gly Ser Glu Lys Gly	Asn Gly Thr Glu Trp	Thr Glu	
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acc aca aca	gac agc ggt aaa acc	gtc acc atc aac agt	ggt cgg	19839
Thr Thr Thr	Asp Ser Gly Lys Thr	Val Thr Ile Asn Ser	Gly Arg	
2600	2605	2610		
gat acg gta	ctg aac ggt gct cag	gtc aac gcc aac agg	att atc	19884
Asp Thr Val	Leu Asn Gly Ala Gln	Val Asn Gly Asn Arg	Ile Ile	
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gcc gat gtg	ggc cac gac ctg ctg	ata agc agc cag cag	gac acc	19929
Ala Asp Val	Gly His Asp Leu Leu	Ile Ser Ser Gln Gln	Asp Thr	
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agt aag tac	gac agt aaa cag acc	agc gtg gct gcc gcc	ggc agt	19974
Ser Lys Tyr	Asp Ser Lys Gln Thr	Ser Val Ala Ala Gly	Gly Ser	
2645	2650	2655		
ttt acc ttt	ggc tcc atg acc gcc	tca ggt tac atc gct	gcc tcc	20019

Phe Thr	Phe	Gly Ser Met Thr	Gly	Ser Gly Tyr Ile Ala	Ala Ser	
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Arg Asp Lys	Met Lys Ser Arg Phe	Asp Ser Val Ala Glu	Gln Thr			
	2675		2680			
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Gly Met Phe	Ala Gly Asp Gly Gly	Phe Asp Ile Thr Val	Gly Arg			
	2690		2695			
cat acc caa	ctg gat ggt gcg gtg	att gcc tcc act gcc	aca ccg	20154		
His Thr Gln	Leu Asp Gly Ala Val	Ile Ala Ser Thr Ala	Thr Pro			
	2705		2710			
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Asp Lys Asn	His Leu Asp Thr Gly	Thr Leu Gly Phe Ser	Asp Leu			
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cac aac gaa	gcg gat tat aaa gtc	agt cac agt gga atc	agt ctg	20244		
His Asn Glu	Ala Asp Tyr Lys Val	Ser His Ser Gly Ile	Ser Leu			
	2735		2740			
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Ser Gly Gly	Gly Ser Phe Gly Asp	Lys Phe Gln Gly Asn	Met Pro			
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Gly Gly Met	Ile Ser Ala Gly Gly	His Ser Gly His Ala	Glu Gly			
	2765		2770			
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Thr Thr Gln	Ala Ala Val Ala Glu	Gly Thr Ile Thr Ile	Arg Asp			
	2780		2785			
agg gac aat	cag aag cag aat ctg	gcg aac ctg agc cgt	gac cct	20424		
Arg Asp Asn	Gln Lys Gln Asn Leu	Ala Asn Leu Ser Arg	Asp Pro			
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Ala His Ala	Asn Asp Ser Ile Ser	Pro Ile Phe Asp Lys	Glu Lys			
	2810		2815			
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Glu Gln Arg	Arg Leu Gln Thr Val	Gly Leu Ile Lys				
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Ser Val Glu Leu Pro Gly Asp Ala Asn	Lys Gly Asp Thr Val Asp		
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Val Thr Phe Glu Asp Glu Lys Gly Gly	Lys His Thr Val Thr Leu		
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Glu Lys Gly Asp Asn Gly Trp Thr Ser	Ser Asp Pro Thr Leu Ile		
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Asn Glu Ser Asp Pro Ser Thr Val Thr	Ser Lys Thr Asp Gly Val		
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acc cgt ccg gac aaa acc acg gag aac gtg aca cat acc gtg act	Thr Arg Pro Asp 3150	Lys Thr Thr Glu Asn 3155	Val Thr His Thr Val 3160	41310
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His Thr Val Thr	Leu Glu Lys Gly Asp	Asn Gly Trp Thr Ser Ser	
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Val Val Asp Phe	Ala Ala Asp Thr Gln	Ile Pro Gly Asp Thr Asp	
3540	3545	3550	
ggg gat ggt gca	aca gat gca aca ccg	gta gtt gcc att ccg gaa	42525

Gly Asp Gly Ala Thr Asp Ala Thr Pro Val Val Ala Ile Pro Glu	3555	3560	3565	
gcg gca gat ggt gtg aat gcc gaa gag ctg aag gat ggt gta cag	3570	3575	3580	42570
Ala Ala Asp Gly Val Asn Ala Glu Leu Lys Asp Gly Val Gln				
acc gaa gtc acg gta ccg aaa gcc agc gct gcc ggt gat acc ctg	3585	3590	3595	42615
Thr Glu Val Thr Val Pro Lys Gly Ser Ala Ala Gly Asp Thr Leu				
acg ctg acg gtc acc aaa ccg gac gcc acg acg gac acg gtg gag	3600	3605	3610	42660
Thr Leu Thr Val Thr Lys Pro Asp Gly Thr Thr Asp Thr Val Glu				
cac acg ctg acc gca gat gaa gtg gct gca ggt aaa gct gat gtg	3615	3620	3625	42705
His Thr Leu Thr Ala Asp Glu Val Ala Gly Lys Ala Asp Val				
acc att ccg gcg gat aaa gtg acg gca gat ggt cag tat tct gta	3630	3635	3640	42750
Thr Ile Pro Ala Asp Lys Val Thr Ala Asp Gly Gln Tyr Ser Val				
acc gcg gaa atc aca gac ccg gca ggt aac acc agt gcc cag gcc	3645	3650	3655	42795
Thr Ala Glu Ile Thr Asp Pro Ala Gly Asn Thr Ser Gly Gln Gly				
cag ccg gct gac ttc gca gtg gat aca gtg gcg ccg tcg gca ccg	3660	3665	3670	42840
Gln Pro Ala Asp Phe Ala Val Asp Thr Val Ala Pro Ser Ala Pro				
gta tta aaa gca gag gat gat ggt tct gtt tct gtt gag ctg ccg	3675	3680	3685	42885
Val Leu Lys Glu Glu Asp Asp Gly Ser Val Ser Val Glu Leu Pro				
ggt gat gcc aat aaa gcc gat acc gtg gat gtc acc ttt gaa gat	3690	3695	3700	42930
Gly Asp Ala Asn Lys Gly Asp Thr Val Asp Val Thr Phe Glu Asp				
gaa aaa ggt ggt aag cac acc gtg acg ctg gag aaa ggg gat aac	3705	3710	3715	42975
Glu Lys Gly Gly Lys His Thr Val Thr Leu Glu Lys Gly Asp Asn				
ggc tgg aca tcc agt gat ccg acg ctg atc ccg gac agc act gcc	3720	3725	3730	43020
Gly Trp Thr Ser Ser Asp Pro Thr Leu Ile Pro Asp Ser Thr Gly				
gat aaa gcg acc att ccg gca gat aac gtg aag gat aac agt gaa	3735	3740	3745	43065
Asp Lys Ala Thr Ile Pro Ala Asp Asn Val Lys Asp Asn Ser Glu				
gtt acc ggg gtt gcc aaa gat ccg agc ggt aat gaa agt gac ccg	3750	3755	3760	43110
Val Thr Gly Val Ala Lys Asp Pro Ser Gly Asn Glu Ser Asp Pro				
tca acc gta acc tca aaa act gat gtg tta cca aca gtg agt att	3765	3770	3775	43155
Ser Thr Val Thr Ser Lys Thr Asp Val Leu Pro Thr Val Ser Ile				
agc gtt gag aca aca tca aca gat gtc aat ggt gat ggt ttt act				43200

Ser Val Glu Thr	Thr Ser Thr Asp Val	Asn Gly Asp Gly Phe Thr	
3780	3785	3790	
ggg ata gct agt	gtc aat ggg acc gta	atg gat gtt ccc gca act	43245
Gly Ile Ala Ser	Val Asn Gly Thr	Met Asp Val Pro Ala Thr	
3795	3800	3805	
att gaa gat aag	gat gat tcc act gga	ctg gtt tat acg gtt tct	43290
Ile Glu Asp Lys	Asp Asp Ser Thr	Gly Leu Val Tyr Thr Val Ser	
3810	3815	3820	
ctg aat cat gtc	act aca aca gat gta	aca gtt aca gtt aca ttg	43335
Leu Asn His Val	Thr Thr Thr Asp	Val Thr Val Thr Val Thr Leu	
3825	3830	3835	
ggg agc gga gct	ggg cat tct gat gct	gct gac tat tct gat att	43380
Gly Ser Gly Ala	Gly His Ser Asp	Ala Asp Tyr Ser Asp Ile	
3840	3845	3850	
ggg gga gca cag	cat aac ggg aaa att	ggc ctt cat ggt gat act	43425
Gly Gly Ala Gln	His Asn Gly Lys	Ile Gly Leu His Gly Asp Thr	
3855	3860	3865	
gga aaa gta acc	tat gat ggt gca aca	acc gta aca att gtt att	43470
Gly Lys Val Thr	Tyr Asp Gly Ala Thr	Thr Val Thr Ile Val Ile	
3870	3875	3880	
cct gcc ggt tca	aaa agt gtt tca ttt	ata gtt gat cca acg ctt	43515
Pro Ala Gly Ser	Lys Ser Val Ser Phe	Ile Val Asp Pro Thr Leu	
3885	3890	3895	
gag gct aac caa	gat gcc ttt aat gcc	gag ggt atg gaa aaa gtt	43560
Glu Ala Asn Gln	Asp Ala Phe Asn Ala	Glu Gly Met Glu Lys Val	
3900	3905	3910	
gtt gcg acc att	acg gga aca tct gat	aac gtt acg gca gct act	43605
Val Ala Thr Ile	Thr Gly Thr Ser Asp	Asn Val Thr Ala Ala Thr	
3915	3920	3925	
gac atc gtt gat	aat gcg gga gca tcc	gca aca ggt gtt att tat	43650
Asp Ile Val Asp	Asn Ala Gly Ala Ser	Ala Thr Gly Val Ile Tyr	
3930	3935	3940	
gat ggt aat gcc	att tca tta cgt aat	ctg gac ggt gat ttt aca	43695
Asp Gly Asn Ala	Ile Ser Leu Arg Asn	Leu Asp Gly Asp Phe Thr	
3945	3950	3955	
ctg aaa tat tca	cta tca tct tct atc	gcc gaa aaa ggg gac ttt	43740
Leu Lys Tyr Ser	Leu Ser Ser Ser Ile	Ala Glu Lys Gly Asp Phe	
3960	3965	3970	
ggg tat acc att	ggc gcg aat agt ggt	gaa aat gat cca atg gta	43785
Gly Tyr Thr Ile	Gly Ala Asn Ser Gly	Glu Asn Asp Pro Met Val	
3975	3980	3985	
aca aca gat tac	aat gat acg gtt tat	gtt ggt tat tac cag agt	43830
Thr Thr Asp Tyr	Asn Asp Thr Val Tyr	Val Gly Tyr Tyr Gln Ser	
3990	3995	4000	
ggg aaa gaa aca	aca tcg tat agt aat	gtt gct aac tca cag gat	43875

Gly Lys Glu Thr	Thr Ser Tyr Ser	Asn Val Ala Asn Ser	Gln Asp	
4005		4010	4015	
aat ggg cca gac	gga aca aaa acc	gat ggc aat caa agc	att acg	43920
Asn Gly Pro Asp	Gly Thr Lys Thr	Gly Asn Gln Ser	Ile Thr	
4020		4025	4030	
act gtt gat tta	ggg gct ggt gat	cta atg gtc att	cgt ggt	43965
Thr Val Asp Leu	Gly Ala Gly Asp	Leu Met Val Ile	Arg Gly	
4035		4040	4045	
aac atg ctg gct	aat aca aga gta	tat act ggt gag ggt	aac gat	44010
Asn Met Leu Ala	Asn Thr Arg Val	Thr Gly Glu Gly	Asn Asp	
4050		4055	4060	
act ttt act atg	gat ggt atg aat	act gca tta cgt	gtt atg	44055
Thr Phe Thr Met	Asp Gly Met Asn	Thr Ala Leu Arg	Val Tyr	
4065		4070	4075	
gcg ggt agt tat	atc ttt act gag	tct ggc gat gat	att gtt	44100
Ala Gly Ser Tyr	Ile Phe Thr Glu	Ser Gly Asp Asp	Ile Val	
4080		4085	4090	
atc aaa cgt act	ggg gta aca aat	gcc gga cag att	tat ctt	44145
Ile Lys Arg Thr	Gly Val Thr Asn	Ala Gly Gln Ile	Tyr Leu	
4095		4100	4105	
tca ggt agt gat	aca ttt atc cag	ggg gat gct act	gac aat	44190
Ser Gly Ser Asp	Thr Phe Ile Gln	Gly Asp Ala Thr	Asn Asn	
4110		4115	4120	
gat aca aca tta	tct ggt tta ttg	gat ctt ggt agt	ggg aca	44235
Asp Thr Thr Leu	Ser Gly Leu Leu	Asp Leu Gly Ser	Gly Thr	
4125		4130	4135	
gat ata tct aat	atg cct aag gaa	tat ctt tct gtt	tat cag	44280
Asp Ile Ser Asn	Met Pro Lys Glu	Tyr Leu Ser Val	Tyr Gln	
4140		4145	4150	
ggc agt aat tta	agc ttg ggt aac	gac aac aat att	gac act	44325
Gly Ser Asn Leu	Ser Leu Gly Asn	Asp Asn Asn Ile	Asp Thr	
4155		4160	4165	
aca gat gtt aat	acc gtc act att	tat ggc tct gtg	tct ggt	44370
Thr Asp Val Asn	Thr Val Thr Ile	Tyr Gly Ser Val	Ser Gly	
4170		4175	4180	
att tta ggc gga	tac ggc agt gat	aat att acg gta	act aaa	44415
Ile Leu Gly Gly	Tyr Gly Ser Asp	Asn Ile Thr Val	Thr Lys	
4185		4190	4195	
ctg acc ggt aat	att tct gtc ggt	gac aat gcg gat	acc tta	44460
Leu Thr Gly Asn	Ile Ser Val Gly	Asp Asn Ala Asp	Thr Leu	
4200		4205	4210	
gcc gga tgg att	tat ggt ggc agt	act gtc tct atg	ggg gac	44505
Ala Gly Trp Ile	Tyr Gly Gly Ser	Thr Val Ser Met	Gly Asp	
4215		4220	4225	
aat gat act gtt	acc atc aca gat	ggg gca tat aac	acg act	44550
			att	

Asn Asp Thr Val Thr Ile Thr Asp Gly Ala Tyr Asn Thr Thr Ile	4230	4235	4240	
tca ctg ggg gcg gga gat gat gta ttt gat gca act tct ggt gta				44595
Ser Leu Gly Ala Gly Asp Asp Val Phe Asp Ala Thr Ser Gly Val	4245	4250	4255	
atg ggg gat tct gct tat gcc act gtc gtt aat ggt gaa gac ggc				44640
Met Gly Asp Ser Ala Tyr Ala Thr Val Val Asn Gly Glu Asp Gly	4260	4265	4270	
aat gat acc ttt aaa tta gcc aca att gcc aaa aac ctg acc att				44685
Asn Asp Thr Phe Lys Leu Gly Thr Ile Ala Lys Asn Leu Thr Ile	4275	4280	4285	
gat gcc ggt gcc ggt gat gat att gtt gtt ctg aca aaa gac tat				44730
Asp Ala Gly Ala Gly Asp Asp Ile Val Val Leu Thr Lys Asp Tyr	4290	4295	4300	
gac tcc acc tcc tcc ggt aat cag gcc tat att aac gcc ggg gaa				44775
Asp Ser Thr Ser Ser Gly Asn Gln Gly Tyr Ile Asn Gly Gly Glu	4305	4310	4315	
ggc agt gat acc ctg gtt ctg aca ggt acc att tct gtc aat cta				44820
Gly Ser Asp Thr Leu Val Leu Thr Gly Thr Ile Ser Val Asn Leu	4320	4325	4330	
gcg gcc ggt aaa aat gaa ggt att gcc gcc ttc gag aaa gtg gat				44865
Ala Ala Gly Lys Lys Asn Glu Gly Ile Ala Gly Phe Glu Lys Val Asp	4335	4340	4345	
atg act gtt ggt agc gat ctg aaa gct gac aat gca gct cag tta				44910
Met Thr Val Gly Ser Asp Leu Lys Ala Asp Asn Ala Ala Gln Leu	4350	4355	4360	
gtc aag tta acn gcc atc gga tgt att ggg tat aaa tga caattcaacg				44959
Val Lys Leu Xaa Gly Ile Gly Cys Ile Gly Tyr Lys	4365	4370		
atttatattt ccggtgatgc caatgacaaa gttgatttgg gggctgacgg agcgggaagt				45019
ctgggtacat ttacggcaac ggcaacaact gttaaagcaa ctgcgttaga tgggtattgag				45079
catacttata cgttatacag cagtgttaagt ggcgcataatg tgtatattga taacaatatt				45139
attgatgcga atggtgtaat ttaatatgtt tcttattcat gtgggagggg aacttccac				45199
atttttgagt gttatagaaa caacttaata atttgcaaat gactcaatat gacatttata				45259
tacttcttgt agaaggcata atgtatgaat ataatgattg ttacgcacaa taaatatctt				45319
gagtttaggtt tgaaaaaatt attgagcagg cattctatta ctattggtgc tgattttttt				45379
ataccagata atcgtgagca tataataaac aataatattt ttgtcattct ctgtgataaa				45439
aaaaacagta tgtaaataaa ttatatattt aacgggtata gattttactt attaccagta				45499
gaatcaataa gtacgctgtc atcgatttat gaatgtatgt ttagtggcag gttgtgtttt				45559
gggaactctc cacataaatt aacctgaat gagatgatta tactattcta ttatgttttc				45619

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catgggtgga atgtagcaag tattgcttat cagtttggtg tgagttcaaa gactgtgtat 45679  
 actcatatat ataaagcaaa gaaaaaaaaat ggaatatcag gaaaaaatct caaatataaa 45739  
 tegtcttatg aaagcctgt ctgttaattg aagtgttggt cgctttatat gaaagttata 45799  
 tgtgataatc gttatttccct tattgggata aacaaaacaa ttgaagatgt catccagaaa 45859  
 aataaaatta atggcgtaaa aaatattatt ataatatcat cccctaaaaa gtcagatgtt 45919  
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 cccctgaaa cctttgattt totcagggat attatccacg cccctatttg caatataaag 46039  
 gatttaacta aaaacaatcc acttaataac acacattata tttatagagt aaagaactct 46099  
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 agtgaggctg tttcaccatt attaatggat gttaattctt cactaacaat ggaaatatit 47359  
 ctgaatatcc caccatcatg gaaccatcgc aacaggcggt atttccgtta atatgtactc 47419

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gacttcaccc tagatccgta atgaaacgcc agttattaac ctgctagggg cctgttttta 47479
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cataattact gctaataata tcgtaatttt gaaagtggta atcctgttca cggcactata 47779
attagagtta tgtctgtgat ccgttcagta taatttcacg aatgctttat taaccgggatg 47839
cgtgaatgtc attcttcaga tgacaaagac gtcatecgga ttgatggaaa agcacttcca 47899
cactcctatg ataaaagccg tcgcaggaga gcgggctttc gtagtcttac cccgactctc 47959
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<210> 252
<211> 2834
<212> PRT
<213> Escherichia coli

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<222> (493)..(493)
<223> The 'Xaa' at location 493 stands for Asn, Asp, His, or Tyr.

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<222> (1158)..(1158)
<223> The 'Xaa' at location 1158 stands for Asp, or Tyr.

<220>
<221> misc_feature
<222> (1159)..(1159)
<223> The 'Xaa' at location 1159 stands for Leu.

<220>
<221> misc_feature
<222> (1168)..(1168)
<223> The 'Xaa' at location 1168 stands for Ser, or Asn.

<220>
<221> misc_feature
<222> (1270)..(1270)
<223> The 'Xaa' at location 1270 stands for Thr, or Pro.

<220>
<221> misc_feature
<222> (13480)..(13480)
<223> Unsure

<220>
<221> misc_feature
<222> (31038)..(31038)

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<223> Unsure

<220>

<221> misc\_feature

<222> (31042)..(31042)

<223> Unsure

<220>

<221> misc\_feature

<222> (31770)..(31770)

<223> Unsure

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<221> misc\_feature

<222> (31799)..(31799)

<223> Unsure

<220>

<221> misc\_feature

<222> (44922)..(44922)

<223> Unsure

<400> 252

Met His Gln Pro Pro Val Arg Phe Thr Tyr Arg Leu Leu Ser Tyr Leu  
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Val Ser Ala Ile Ile Ala Gly Gln Pro Leu Leu Pro Ala Val Gly Ala  
20 25 30

Val Ile Thr Pro Gln Asn Gly Ala Gly Met Asp Lys Ala Ala Asn Gly  
35 40 45

Val Pro Val Val Asn Ile Ala Thr Pro Asn Gly Ala Gly Ile Ser His  
50 55 60

Asn Arg Phe Thr Asp Tyr Asn Val Gly Lys Glu Gly Leu Ile Leu Asn  
65 70 75 80

Asn Ala Thr Gly Lys Leu Asn Pro Thr Gln Leu Gly Gly Leu Ile Gln  
85 90 95

Asn Asn Pro Asn Leu Lys Ala Gly Gly Glu Ala Lys Gly Ile Ile Asn  
100 105 110

Glu Val Thr Gly Gly Lys Arg Ser Leu Leu Gln Gly Tyr Thr Glu Val  
115 120 125

Ala Gly Lys Ala Ala Asn Val Met Val Ala Asn Pro Tyr Gly Ile Thr  
130 135 140

Cys Asp Gly Cys Gly Phe Ile Asn Thr Pro His Ala Thr Leu Thr Thr  
145 150 155 160

Gly Lys Pro Val Met Asn Ala Asp Gly Ser Leu Gln Ala Leu Glu Val  
165 170 175

Thr Glu Gly Ser Ile Thr Ile Asn Gly Ala Gly Leu Asp Gly Thr Arg  
180 185 190

Ser Asp Ala Val Ser Ile Ile Ala Arg Ala Thr Glu Val Asn Ala Ala  
195 200 205

Leu His Ala Lys Asp Leu Thr Val Thr Ala Gly Ala Asn Arg Val Thr  
210 215 220

Ala Asp Gly Arg Val Arg Ala Leu Lys Gly Glu Gly Asp Val Pro Lys  
225 230 235 240

Val Ala Val Asp Thr Gly Ala Leu Gly Gly Met Tyr Ala Arg Arg Ile  
245 250 255

His Leu Thr Ser Thr Glu Ser Gly Val Gly Val Asn Leu Gly Asn Leu  
260 265 270

Tyr Ala Arg Asp Gly Asp Ile Thr Leu Asp Ala Ser Gly Arg Leu Thr  
275 280 285

Val Asn Asn Ser Leu Ala Thr Gly Ala Val Thr Ala Lys Gly Gln Gly  
290 295 300

Val Thr Leu Thr Gly Asp His Lys Ala Gly Gly Asn Leu Ser Val Ser  
305 310 315 320

Ser Arg Arg Asp Ile Val Leu Ser Asn Gly Thr Leu Asn Ser Asp Lys  
325 330 335

Asp Leu Ser Leu Thr Ala Gly Gly Arg Ile Thr Gln Gln Asn Glu Lys  
340 345 350

Leu Thr Ala Gly Arg Asp Val Thr Leu Ala Ala Lys Asn Ile Thr Gln  
355 360 365

Asp Thr Ala Ser Gln Ile Asn Ala Ala Arg Asp Ile Val Thr Val Ala  
370 375 380

Ser Asp Thr Leu Thr Thr Gln Gly Gln Ile Thr Ala Gly Gln Asn Leu  
385 390 395 400

Thr Ala Ser Ala Thr Thr Leu Thr Gln Asp Gly Ile Leu Leu Ala Lys  
405 410 415

Ser His Ala Gly Leu Asn Ala Gly Thr Leu Asn Asn Ser Gly Ala Val  
420 425 430

Gln Gly Ala Thr Leu Thr Leu Gly Ser Thr Thr Leu Ser Asn Ser Gly  
435 440 445

Ser Leu Leu Ser Gly Gly Pro Leu Thr Met Asn Thr Arg Asp Phe Thr  
450 455 460

Gln Ser Gly Arg Thr Gly Ala Lys Gly Lys Val Asp Ile Met Ala Ser  
465 470 475 480

Gly Lys Leu Thr Ser Thr Gly Leu Leu Val Ser Asp Xaa Ala Leu Val  
485 490 495

Leu Lys Ala Gln Asp Val Thr Gln Asn Gly Val Leu Ser Gly Gly Lys  
500 505 510

Gly Leu Thr Val Ser Ala Gln Thr Leu Ser Ser Gly Lys Lys Ser Val  
515 520 525

Thr His Ser Asp Ala Ala Met Thr Leu Asn Val Thr Thr Val Ala Leu  
530 535 540

Asp Gly Glu Thr Ser Ala Gly Asp Thr Leu Arg Val Gln Ala Asp Lys  
545 550 555 560

Leu Ser Thr Ala Ala Gly Ala Gln Leu Gln Ser Gly Lys Asn Leu Ser  
565 570 575

Ile Asn Ala Arg Asp Ala Arg Leu Ala Gly Thr Gln Ala Ala Gln Gln  
580 585 590

Thr Met Val Val Asn Ala Ser Glu Lys Leu Thr His Ser Gly Lys Ser  
595 600 605

Ser Ala Pro Ser Leu Ser Leu Ser Ala Pro Glu Leu Thr Ser Ser Gly  
610 615 620

Val Leu Val Gly Ser Ala Leu Asn Thr Gln Ser Gln Thr Leu Thr Asn  
625 630 635 640

Ser Gly Leu Leu Gln Gly Glu Ala Ser Leu Thr Val Asn Thr Gln Arg  
645 650 655

Leu Asp Asn Gln Gln Asn Gly Thr Leu Tyr Ser Ala Ala Asp Leu Thr  
660 665 670

Leu Asp Ile Pro Asp Ile Arg Asn Ser Gly Leu Ile Thr Gly Asp Asn  
675 680 685

Gly Leu Met Leu Asn Ala Val Ser Leu Ser Asn Pro Gly Lys Ile Ile  
690 695 700

Ala Asp Thr Leu Ser Val Arg Ala Thr Thr Leu Asp Gly Asp Gly Leu  
705 710 715 720

Leu Gln Gly Ala Gly Ala Leu Ala Leu Ala Gly Asp Thr Leu Ser Gln  
725 730 735

Gly Ser His Gly Arg Trp Leu Thr Ala Asp Asp Leu Ser Leu Arg Gly  
740 745 750

Lys Thr Leu Asn Thr Ala Gly Thr Thr Gln Gly Gln Asn Ile Thr Val  
755 760 765

Gln Ala Asp Arg Trp Ala Asn Ser Gly Ser Val Leu Ala Thr Gly Asn  
770 775 780

Leu Thr Ala Ser Ala Thr Gly Gln Leu Thr Ser Thr Gly Asp Ile Met  
785 790 795 800

Ser Gln Gly Asp Thr Thr Leu Lys Ala Ala Thr Thr Asp Asn Arg Gly  
805 810 815

Ser Leu Leu Ser Ala Gly Thr Leu Ser Leu Asp Gly Asn Ser Leu Asp  
820 825 830

Asn Arg Gly Thr Val Gln Gly Asn His Val Thr Ile Arg Gln Asn Ser  
835 840 845

Val Thr Asn Ser Gly Thr Leu Thr Gly Ile Ala Ala Leu Thr Leu Ala  
850 855 860

Ala Arg Met Ala Ser Pro Gln Pro Ala Leu Met Asn Asn Gly Gly Ser  
865 870 875 880

Leu Leu Thr Ser Gly Asp Leu Thr Ile Thr Ala Gly Ser Ile Thr Ser  
885 890 895

Ser Gly His Trp Gln Gly Lys Arg Val Leu Ile Thr Ala Asp Ser Leu  
900 905 910

Ala Asn Ser Gly Ala Ile Gln Ala Ala Asp Ser Leu Thr Ala Arg Leu  
915 920 925

Thr Gly Glu Leu Val Ser Thr Ala Gly Ser Lys Val Thr Ser Asn Gly  
930 935 940

Glu Met Ala Leu Ser Ala Leu Asn Leu Ser Asn Ser Gly Gln Trp Ile  
945 950 955 960

Ala Lys Asn Leu Thr Leu Lys Ala Asn Ser Leu Thr Ser Ala Gly Asp  
965 970 975

Ile Thr Gly Val Asp Thr Leu Thr Leu Thr Val Asn Gln Thr Leu Asn  
980 985 990

Asn Gln Ala Asn Gly Lys Leu Leu Ser Ala Gly Val Leu Thr Leu Lys  
995 1000 1005

Ala Asp Ser Val Thr Asn Asp Gly Gln Leu Gln Gly Asn Val Thr  
1010 1015 1020

Thr Ile Thr Ala Gly Gln Leu Thr Asn Gly Gly His Leu Gln Gly  
1025 1030 1035

Glu Thr Leu Thr Leu Thr Ala Ser Gly Gly Val Asn Asn Arg Ser  
1040 1045 1050

Gly Gly Val Leu Met Ser Arg Asn Ala Leu Asn Val Ser Thr Ala  
1055 1060 1065

Thr Leu Ser Asn Gln Ser Thr Ile Gln Gly Gly Gly Val Ser  
1070 1075 1080

Leu Asn Ala Thr Asp Arg Leu Gln Asn Asp Gly Lys Ile Leu Ser  
1085 1090 1095

Gly Ser Asn Leu Thr Leu Thr Ala Gln Val Leu Ala Asn Thr Gly  
1100 1105 1110

Ser Gly Leu Val Gln Ala Ala Thr Leu Leu Leu Asp Val Val Asn  
1115 1120 1125

Thr Val Asn Gly Gly Arg Val Leu Ala Thr Gly Ser Ala Asp Val  
1130 1135 1140

Lys Gly Thr Thr Leu Asn Asn Thr Gly Thr Leu Gln Gly Ala Xaa  
1145 1150 1155

Xaa Leu Val Asn Tyr His Thr Phe Ser Xaa Ser Gly Thr Leu Leu  
1160 1165 1170

Gly Thr Ser Gly Leu Gly Val Lys Gly Ser Ser Leu Leu Gln Asn  
1175 1180 1185

Gly Thr Gly Arg Leu Tyr Ser Ala Gly Asn Leu Leu Leu Asp Ala  
1190 1195 1200

Gln Asp Phe Ser Gly Gln Gly Gln Val Val Ala Thr Gly Asp Val  
1205 1210 1215

Thr Leu Lys Leu Ile Ala Ala Leu Thr Asn His Gly Thr Leu Ala  
1220 1225 1230

Ala Gly Lys Thr Leu Ser Val Thr Ser Gln Asn Ala Ile Thr Asn  
1235 1240 1245

Gly Gly Val Met Gln Gly Asp Ala Met Val Leu Gly Ala Gly Glu  
1250 1255 1260

Ala Phe Thr Asn Asn Gly Xaa Leu Thr Ala Gly Lys Gly Asn Ser  
1265 1270 1275

Val Phe Ser Ala Gln Arg Leu Phe Leu Asn Ala Pro Gly Ser Leu  
1280 1285 1290

Gln Gly Gly Gly Asp Val Ser Leu Asn Ser Arg Ser Asp Ile Thr  
1295 1300 1305

Ile Ser Gly Phe Thr Gly Thr Ala Gly Ser Leu Thr Met Asn Val  
1310 1315 1320

Ala Gly Thr Leu Leu Asn Ser Ala Leu Ile Tyr Ala Gly Asn Asn  
1325 1330 1335

Leu Lys Leu Phe Thr Asp Arg Leu His Asn Gln His Gly Asp Ile  
1340 1345 1350

Leu Ala Gly Asn Ser Leu Trp Val Gln Lys Asp Ala Ser Gly Gly  
1355 1360 1365

Ala Asn Thr Glu Ile Ile Asn Asn Ser Gly Asn Ile Glu Thr His  
1370 1375 1380

Gln Gly Asp Ile Val Val Arg Thr Gly His Leu Leu Asn Gln Arg  
1385 1390 1395

Glu Gly Phe Ser Ala Thr Thr Thr Arg Thr Asn Pro Ser Ser  
1400 1405 1410

Ile Gln Gly Met Gly Asn Ala Leu Val Asp Ile Pro Leu Ser Leu  
1415 1420 1425

Leu Pro Asp Gly Ser Tyr Gly Tyr Phe Thr Arg Glu Val Glu Asn  
1430 1435 1440

Gln His Gly Thr Pro Cys Asn Gly His Gly Ala Cys Asn Ile Thr  
1445 1450 1455

Met Asp Thr Leu Tyr Tyr Tyr Ala Pro Phe Ala Asp Ser Ala Thr  
1460 1465 1470

Gln Arg Phe Leu Ser Ser Gln Asn Ile Thr Thr Val Thr Gly Ala  
1475 1480 1485

Asp Asn Pro Ala Gly Arg Ile Ala Ser Gly Arg Asn Leu Ser Ala  
1490 1495 1500

Glu Ala Glu Arg Leu Glu Asn Arg Ala Ser Phe Ile Leu Ala Asn  
1505 1510 1515

Gly Asp Ile Ala Leu Ser Gly Arg Glu Leu Ser Asn Gln Ser Trp  
1520 1525 1530

Gln Thr Gly Thr Glu Asn Glu Tyr Leu Val Tyr Arg Tyr Asp Pro  
1535 1540 1545

Lys Thr Phe Tyr Gly Ser Tyr Ala Thr Gly Ser Leu Asp Lys Leu  
 1550 1555 1560  
 Pro Leu Leu Ser Pro Glu Phe Glu Asn Asn Thr Ile Arg Phe Ser  
 1565 1570 1575  
 Leu Asp Gly Arg Glu Lys Asp Tyr Thr Pro Gly Lys Thr Tyr Tyr  
 1580 1585 1590  
 Ser Val Ile Gln Ala Gly Gly Asp Val Lys Thr Arg Phe Thr Ser  
 1595 1600 1605  
 Ser Ile Asn Asn Gly Thr Thr Thr Ala His Ala Gly Ser Val Ser  
 1610 1615 1620  
 Pro Val Val Ser Ala Pro Val Leu Asn Thr Leu Ser Gln Gln Thr  
 1625 1630 1635  
 Gly Gly Asp Ser Leu Thr Gln Thr Ala Leu Gln Gln Tyr Glu Pro  
 1640 1645 1650  
 Val Val Val Gly Ser Pro Gln Trp His Asp Glu Leu Ala Gly Ala  
 1655 1660 1665  
 Leu Lys Asn Ile Ala Gly Gly Ser Pro Leu Thr Gly Gln Thr Gly  
 1670 1675 1680  
 Ile Ser Asp Asp Trp Pro Leu Pro Ser Gly Asn Asn Gly Tyr Leu  
 1685 1690 1695  
 Val Pro Ser Thr Asp Pro Asp Ser Pro Tyr Leu Ile Thr Val Asn  
 1700 1705 1710  
 Pro Lys Leu Asp Gly Leu Gly Gln Val Asp Ser His Leu Phe Ala  
 1715 1720 1725  
 Gly Leu Tyr Glu Leu Leu Gly Ala Lys Pro Gly Gln Ala Pro Arg  
 1730 1735 1740  
 Glu Thr Ala Pro Ser Tyr Thr Asp Glu Lys Gln Phe Leu Gly Ser  
 1745 1750 1755  
 Ser Tyr Phe Leu Asp Arg Leu Gly Leu Lys Pro Glu Lys Asp Tyr  
 1760 1765 1770



Arg Phe Leu Gly Asp Ala Val Phe Asp Thr Arg Tyr Val Ser Asn  
1775 1780 1785

Ala Val Leu Ser Arg Thr Gly Ser Arg Tyr Leu Asn Gly Leu Gly  
1790 1795 1800

Ser Asp Thr Glu Gln Met Arg Tyr Leu Met Asp Asn Ala Ala Arg  
1805 1810 1815

Gln Gln Lys Gly Leu Gly Leu Glu Phe Gly Val Ala Leu Thr Ala  
1820 1825 1830

Glu Gln Ile Ala Gln Leu Asp Gly Ser Ile Leu Trp Trp Glu Ser  
1835 1840 1845

Val Thr Ile Asn Gly Gln Thr Val Met Val Pro Lys Leu Tyr Leu  
1850 1855 1860

Ser Pro Glu Asp Ile Thr Leu His Asn Gly Ser Val Ile Ser Gly  
1865 1870 1875

Asn Asn Val Gln Leu Ala Gly Gly Asn Ile Thr Asn Ser Gly Gly  
1880 1885 1890

Ser Ile Asn Ala Gln Asn Asp Leu Ser Leu Asp Ser Ser Gly Tyr  
1895 1900 1905

Ile Asp Asn Leu Asn Ala Gly Leu Ile Ser Ala Gly Gly Ser Leu  
1910 1915 1920

Asp Leu Ser Ala Ile Gly Asp Ile Ser Asn Ile Ser Ser Val Ile  
1925 1930 1935

Ser Gly Lys Thr Val Gln Leu Glu Ser Val Ser Gly Asn Ile Ser  
1940 1945 1950

Asn Ile Thr Arg Arg Gln Gln Trp Asn Ala Gly Ser Asp Ser Gln  
1955 1960 1965

Tyr Gly Gly Val His Leu Ser Gly Thr Asp Thr Gly Pro Val Ala  
1970 1975 1980

Thr Ile Lys Gly Thr Asp Ser Leu Ser Leu Asp Ala Gly Lys Asn  
1985 1990 1995

Ile Asp 2000	Ile Thr Gly Ala Thr 2005	Val Ser Ser Gly Gly 2010	Asp Leu Gly
Met Ser 2015	Ala Gly Asn Asp Ile 2020	Asn Ile Ala Ala Asn 2025	Leu Ile Ser
Gly Ser 2030	Lys Ser Gln Ser Gly 2035	Phe Trp His Thr Asp 2040	Asp Asn Ser
Ser Ser 2045	Ser Thr Thr Ser Gln 2050	Gly Ser Ser Ile Ser 2055	Ala Gly Gly
Asn Leu 2060	Ala Met Ala Ala Gly 2065	His Asn Leu Asp Val 2070	Thr Ala Ser
Ser Val 2075	Ser Ala Gly His Ser 2080	Ala Leu Leu Ser Ala 2085	Gly Asn Asp
Leu Ser 2090	Leu Asn Ala Val Arg 2095	Glu Ser Lys Asn Ser 2100	Arg Asn Gly
Arg Ser 2105	Glu Ser His Glu Ser 2110	His Ala Ala Val Ser 2115	Thr Val Thr
Ala Gly 2120	Asp Asn Phe Leu Leu 2125	Val Ala Gly Arg Asp 2130	Ile Ala Ser
Gln Ala 2135	Ala Gly Met Ala Ala 2140	Glu Asn Asn Val Val 2145	Ile Arg Gly
Gly Arg 2150	Asp Val Asn Leu Val 2155	Ala Glu Ser Ala Gly 2160	Ala Gly Asp
Ser Tyr 2165	Thr Ser Lys Lys Lys 2170	Lys Glu Ile Asn Glu 2175	Thr Val Arg
Gln Gln 2180	Gly Thr Glu Ile Ala 2185	Ser Gly Gly Asp Thr 2190	Thr Val Asn
Ala Gly 2195	Arg Asp Ile Thr Ala 2200	Val Ala Ser Ser Val 2205	Thr Ala Thr
Gly Asn 2210	Ile Ser Val Asn Ala 2215	Gly Arg Asp Val Ala 2220	Leu Thr Thr

Ala Thr Glu Ser Asp Tyr His Tyr Leu Glu Thr Lys Lys Lys Ser  
2225 2230 2235

Gly Gly Phe Leu Ser Lys Lys Thr Thr Arg Thr Ile Ser Glu Asp  
2240 2245 2250

Ser Ala Thr Arg Glu Ala Gly Ser Leu Leu Ser Gly Asn Arg Val  
2255 2260 2265

Thr Val Asn Ala Gly Asp Asn Leu Thr Val Glu Gly Ser Asp Val  
2270 2275 2280

Val Ala Asp Arg Asp Val Ser Leu Ala Ala Gly Asn His Val Asp  
2285 2290 2295

Val Leu Ala Ala Thr Ser Thr Asp Thr Ser Trp Arg Phe Lys Glu  
2300 2305 2310

Thr Lys Lys Ser Gly Leu Met Gly Thr Gly Gly Ile Gly Phe Thr  
2315 2320 2325

Ile Gly Ser Ser Lys Thr Thr His Asp Arg Arg Glu Ala Gly Thr  
2330 2335 2340

Thr Gln Ser Gln Ser Ala Ser Thr Ile Gly Ser Thr Ala Gly Asn  
2345 2350 2355

Val Ser Ile Thr Ala Gly Lys Gln Ala His Ile Ser Gly Ser Asp  
2360 2365 2370

Val Ile Ala Asn Arg Asp Ile Ser Ile Thr Gly Asp Ser Val Val  
2375 2380 2385

Val Asp Pro Gly His Asp Arg Arg Thr Val Asp Glu Lys Phe Glu  
2390 2395 2400

Gln Lys Lys Ser Gly Leu Thr Val Ala Leu Ser Gly Thr Val Gly  
2405 2410 2415

Ser Ala Ile Asn Asn Ala Val Thr Ser Ala Gln Glu Thr Lys Glu  
2420 2425 2430

Ser Ser Asp Ser Arg Leu Lys Ala Leu Gln Ala Thr Lys Thr Ala  
2435 2440 2445

Leu Ser	Gly Val	Gln Ala	Gly	Gln Ala	Ala Thr	Met	Ala Ser	Ala	
2450			2455				2460		
Thr Gly	Asp Pro	Asn Ala	Met	Gly Val	Ser Leu	Ser	Leu Thr	Thr	
2465			2470				2475		
Gln Lys	Ser Lys	Ser Gln	Gln	His Ser	Glu Ser	Asp	Thr Val	Ser	
2480			2485				2490		
Gly Ser	Thr Leu	Asn Ala	Gly	Asn Asn	Leu Ser	Val	Val Ala	Thr	
2495			2500				2505		
Gly Lys	Asn Arg	Gly Asp	Asn	Arg Gly	Asp Ile	Val	Ile Ala	Gly	
2510			2515				2520		
Ser Gln	Leu Lys	Ala Gly	Gly	Asn Thr	Ser Leu	Asp	Ala Ala	Asn	
2525			2530				2535		
Asp Ile	Leu Leu	Ser Gly	Ala	Ala Asn	Thr Gln	Lys	Thr Thr	Gly	
2540			2545				2550		
Arg Asn	Ser Ser	Ser Gly	Gly	Gly Val	Gly Val	Ser	Ile Gly	Ala	
2555			2560				2565		
Gly Gly	Asn Gly	Ala Gly	Ile	Ser Val	Phe Ala	Gly	Val Asn	Ala	
2570			2575				2580		
Ala Lys	Gly Ser	Glu Lys	Gly	Asn Gly	Thr Glu	Trp	Thr Glu	Thr	
2585			2590				2595		
Thr Thr	Asp Ser	Gly Lys	Thr	Val Thr	Ile Asn	Ser	Gly Arg	Asp	
2600			2605				2610		
Thr Val	Leu Asn	Gly Ala	Gln	Val Asn	Gly Asn	Arg	Ile Ile	Ala	
2615			2620				2625		
Asp Val	Gly His	Asp Leu	Leu	Ile Ser	Ser Gln	Gln	Asp Thr	Ser	
2630			2635				2640		
Lys Tyr	Asp Ser	Lys Gln	Thr	Ser Val	Ala Ala	Gly	Gly Ser	Phe	
2645			2650				2655		
Thr Phe	Gly Ser	Met Thr	Gly	Ser Gly	Tyr Ile	Ala	Ala Ser	Arg	
2660			2665				2670		

Asp Lys Met Lys Ser Arg Phe Asp Ser Val Ala Glu Gln Thr Gly  
2675 2680 2685

Met Phe Ala Gly Asp Gly Gly Phe Asp Ile Thr Val Gly Arg His  
2690 2695 2700

Thr Gln Leu Asp Gly Ala Val Ile Ala Ser Thr Ala Thr Pro Asp  
2705 2710 2715

Lys Asn His Leu Asp Thr Gly Thr Leu Gly Phe Ser Asp Leu His  
2720 2725 2730

Asn Glu Ala Asp Tyr Lys Val Ser His Ser Gly Ile Ser Leu Ser  
2735 2740 2745

Gly Gly Gly Ser Phe Gly Asp Lys Phe Gln Gly Asn Met Pro Gly  
2750 2755 2760

Gly Met Ile Ser Ala Gly Gly His Ser Gly His Ala Glu Gly Thr  
2765 2770 2775

Thr Gln Ala Ala Val Ala Glu Gly Thr Ile Thr Ile Arg Asp Arg  
2780 2785 2790

Asp Asn Gln Lys Gln Asn Leu Ala Asn Leu Ser Arg Asp Pro Ala  
2795 2800 2805

His Ala Asn Asp Ser Ile Ser Pro Ile Phe Asp Lys Glu Lys Glu  
2810 2815 2820

Gln Arg Arg Leu Gln Thr Val Gly Leu Ile Lys  
2825 2830

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<223> The 'Xaa' at location 1531 stands for Thr.

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<222> (13480)..(13480)

<223> Unsure

<220>

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 <223> Unsure

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Gln Cys Thr Ala Val Phe Asn Ile Val Gly Glu Asp Gly Gln Val Thr  
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Ser Val Asn Gly Thr Val Met Asp Val Pro Ala Thr Ile Glu Asp Lys  
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Gly Ala Ala Leu Arg Gly Tyr Ala Ile Ser Pro Ser Pro Phe Phe Leu	15 20 25
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Val Phe Leu Ser Pro His Phe Arg Leu Arg Gln Pro Cys Cys Leu Arg	30 35 40
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Val Ala Gly Thr Leu Leu Asn Ser Ala Leu Ile Tyr Ala Gly Asn Asn	45 50 55
ctg aag ctg ttt aca gac cgt ctg cat aac cag cat ggt gat atc ctg	32165
Leu Lys Leu Phe Thr Asp Arg Leu His Asn Gln His Gly Asp Ile Leu	60 65 70 75
gcc gac aac agt ctg tgg gta cag aag gac agc agc ggg acg gca aac	32213
Ala Asp Asn Ser Leu Trp Val Gln Lys Asp Ser Ser Gly Thr Ala Asn	80 85 90
agc gaa atc att aac cgt tcc ggt aat att gaa acc atg cgt gcc gat	32261
Ser Glu Ile Ile Asn Arg Ser Gly Asn Ile Glu Thr Met Arg Gly Asp	95 100 105
atc acc atg aat acg gcg cat ctg ctg aat tca tgg gat gcc att tgc	32309
Ile Thr Met Asn Thr Ala His Leu Leu Asn Ser Trp Asp Ala Ile Ser	110 115 120
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Ala Ser His Glu Val Ile Pro Gly Ser Ser Arg Gly Val Ile Ser Pro	125 130 135
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Val Pro Glu Asn Asn Arg Trp Gly Val Val Arg His Asp Gly Val	140 145 150 155
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Glu Tyr Leu Ala Val Tyr Trp Gly Lys Gly Ala Thr Val Pro Asp Glu	160 165 170
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Tyr Arg Ile Arg Thr Gly Asp Thr Asp Thr Val Thr Val Ser Ala Thr	175 180 185
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Gly His Ala Ala Arg Ile Ser Gly Gly Ala Asp Met His Ile Arg Ala	190 195 200
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Gly Arg Leu Asp Asn Glu Ala Ser Phe Ile Leu Ala Gly Gly Ser Met	205 210 215

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Asp Arg Leu His Asn Gln His Gly Asp Ile Leu Ala Asp Asn Ser Leu  
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105

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Ala Leu Pro Asp Thr Leu Lys Asp Ile Pro Gly Ala Leu Ser Leu Tyr  
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580

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590

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Page 755

820

825

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